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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,615	08/05/2003	Masayuki Tanaka	04329.3104	5383
22852	7590	09/20/2005	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			BRYANT, DELORIS S	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/633,615	Applicant(s) TANAKA, MASAYUKI	
	Examiner Deloris Bryant	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/05/03, 06/26/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 9-20 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 31, 2005.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 21. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 5 is objected to because of the following informalities: the word "meal" needs to be changed to "metal" in line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The structure wherein a metal of the metal silicide has a stacked structure composed of a plurality of layers is made unclear. Clarification is needed whether the plurality of layers are all the same material in this stacked structure or is there a combination of materials in this structure.

Claim 6 also recites the limitation "a metal of the metal silicide" in line 2. A metal has been distinctly claimed in claim 5 so "a metal of the metal silicide" lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsubara (6271594).

Matsubara discloses a semiconductor substrate (fig. 4; 101); source/drain regions (fig. 4; 106) provided on a channel region between the source/drain regions (fig.

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4; 106); a gate electrode (fig. 4; 104) provided on the gate insulating film (fig. 4; 103); a conductive layer of a metal silicide (fig. 4; 108) provided on the gate electrode (fig. 4; 104) and the source/drain regions (fig. 4; 106); an insulating film containing carbon (fig. 4; 113) provided on the semiconductor substrate (fig. 4; 101) so as to be in contact with at least the conductive layer (fig. 4; 108); and an interlayer insulating film provided on the semiconductor substrate (fig. 4; 101) so as to cover the insulating film containing carbon (fig. 4; 113).

Regarding claim 5, Matsubara discloses a metal of the metal silicide is at least one selected from a group consisting of tantalum, cobalt, titanium, molybdenum, hafnium, tungsten, platinum and palladium (col. 6, lns 64-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara in view of Tanaka et al (6,333,547). Matsubara discloses an insulating film containing carbon (see fig. 4; 113). Matsubara does not disclose that the insulating film is mainly silicon nitride or the concentration of carbon, chlorine or hydrogen.

Tanaka et al. teaches an insulating layer of silicon nitride containing carbon (col. 31, Ins 50-51) (claim 2) and the concentration of all three: carbon, chlorine and hydrogen. The carbon concentration in an insulating film is to be at least $4 \times 10^{20} \text{ cm}^{-3}$ (col. 28, line 33-34) (claim 3), the chlorine concentration is to be at least $4 \times 10^{20} \text{ cm}^{-3}$ (col. 28, line 33-34) (claim 7) and the hydrogen concentration is $5 \times 10^{21} \text{ cm}^{-3}$ (col. 28, Ins 27-29) (claim 8). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to use a silicon nitride layer containing carbon, chlorine and hydrogen within the range specified by Tanaka et al as the insulating film of Matsubara. One would have been motivated to so modify Matsubara to decrease the parasitic capacitance of the interlayer insulating film (col. 30, Ins 5-6). By doing so, the "RC delay resistance" is diminished thus improving the characteristics of the device (col. 30, Ins 44-45).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara in view of Konuma et al. Matsubara discloses a titanium film (col. 6, Ins 57-67). Matsuara, however, does not disclose nickel as one of the options for the metal layer. Konuma et al teaches a metal film made with titanium and also teaches that in

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place of titanium other metals may be used instead, which nickel is one of those other metals. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to replace the titanium with nickel. One would have been motivated to so modify Matsubara with any of the other metals to provide a stable interface (col. 9, line 65).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deloris Bryant whose telephone number is (703) 872-0237. The examiner can normally be reached on M-F 7:30-4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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GEORGE ECKERT
PRIMARY EXAMINER